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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,212	05/12/2006	Takeshi Nozaki	10517/329	6264

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EXAMINER	
DEB, ANJAN K	

ART UNIT	PAPER NUMBER
2858	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/579,212	NOZAKI, TAKESHI	
	Examiner	Art Unit	
	Anjan K. Deb	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *05/12/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 8-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okoshi (US 6,757,598 B2) in view of Watanabe (US 6,285,163 B1).

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Re claim 8, Okoshi disclosed abnormality monitoring apparatus (Fig. 1) in a load drive circuit which includes a converter 29 (INVERTER) for performing at least one of an operation for increasing a voltage and an operation for decreasing a voltage, and a battery 43 connected to an input side of the converter, the converter supplying electric power to a load 25 (DRIVE MOTOR), the abnormality monitoring apparatus comprising: first detecting means 72 (BATTERY VOLTAGE SENSOR) for detecting a voltage value of the battery, second

detecting means 76 (DRIVE MOTOR CONVERTER SENSOR) for detecting a voltage value VM on an output side of the converter 29, battery voltage estimating means 91 (SYSTEM VOLTAGE DETERMINATION PROCESSING MEANS) for calculating an estimated voltage value of the battery (column 15 line 25)(processing means sets the battery voltage).

While disclosed Okoshi calculating means for calculating at least one of the difference value between the voltage value VG and battery voltage VB (column 14 line 53) it did not expressly disclose calculating the difference between voltage value detected by first detecting means and the estimated voltage value, and calculating the difference value between the voltage value detected by the second detecting means and the estimated voltage value.

Watanabe disclosed detecting abnormality (column 9 line 62,63) condition in a battery by sensing battery voltage 12 and comparing 24 with estimated voltage (Vest) of the battery (Fig. 3,7).

At the time the invention was made it would have been obvious for one of ordinary skill in the art to modify Okoshi by calculating a difference in voltage between an estimated battery voltage and a measured battery voltage disclosed as disclosed by Watanabe as an alternative method of detecting abnormality.

Re claims 9,10,16 Okoshi disclosed abnormality detection apparatus includes detecting an abnormality in first detection means (battery voltage VB) and second detection means (VM) by calculating absolute values of first and second voltage differences |VM-VG| and |VG-VB| (column 14 line 43, 53). Converter performing increasing or decreasing the voltage is inherently disclosed as these are normal functions of converter.

Okoshi did not expressly disclose first and second voltage differences are calculated with respect to an estimated battery voltage.

Watanabe disclosed detecting abnormality (column 9 line 62,63) condition in a battery by sensing battery voltage 12 and comparing 24 with estimated voltage (Vest) of the battery (Fig. 3,7).

At the time the invention was made it would have been obvious for one of ordinary skill in the art to modify Okoshi by calculating a difference in voltage between an estimated battery voltage and a measured battery voltage disclosed as disclosed by Watanabe as an alternative method of detecting abnormality.

Re claim 11, Okoshi disclosed electric current value detecting means (detect battery current) for detecting an electric current (column 8 line 13-17) value of the battery, and means for estimating battery voltage.

Okoshi as modified by Watanabe did not expressly disclose estimated voltage value is based on an electric power command value indicating a value of electric power supplied to the load and the electric current value of the battery but would have obvious since it is known that voltage (V) can be estimated from the relation V=P/I (where P=Power and I =current).

At the time the invention was made it would have been obvious for one of ordinary skill in the art to modify Okoshi by including a means for estimating battery voltage from the relation V=P/I for determining abnormal condition.

Re claim 12, Okoshi did not expressly disclose learning means for learning and calculating the estimated voltage value.

Watanabe disclosed calculating means (neural network) (Fig. 5) for learning and calculating the estimated voltage value (dynamic voltage change estimating means 20)(column 8 line 36-42).

At the time the invention was made it would have been obvious for one of ordinary skill in the art to modify Okoshi by adding learning means disclosed by Watanabe for responding to the non-linear characteristic of the battery for calculating the estimated voltage value.

Re claim 13, Okoshi disclosed abnormal monitoring apparatus includes monitoring an abnormality of at least one of the first detecting means and the second detecting means by continuing to monitor an abnormal state of at least one of the first detecting means (S1-9) and the second detecting means (S1-8) for a predetermined time or more (Fig. 14).

Re claims 14 and 15, Okoshi disclosed abnormality monitoring method and apparatus in a load drive circuit which includes a converter 29 for performing at least one of an operation for increasing a voltage and an operation for decreasing a voltage, and a battery 43 connected to an input side of the converter 29, the converter 29 supplying electric power to a load 25, the abnormality monitoring apparatus comprising the steps of: detecting a voltage value of the battery by BATTERY VOLTAGE SENSOR 72; detecting a voltage value on an output side of the converter 29 by DRIVE MOTOR CONVERTER SENSOR 76; calculating an estimated voltage value of the battery (SYSTEM VOLTAGE DETERMINATION PROCESSING MEANS) (column 15 line 25)(processing means sets the battery voltage).

Okoshi did not expressly disclose calculating at least one of the difference value between the detected voltage value of the battery and the estimated voltage value, and the difference value between the detected voltage value on the output side of the converter and the estimated voltage value, and monitoring at least one of an abnormality of detection of the voltage value of the battery and an abnormality of detection of the voltage value on the output side of the converter based on each of the difference values and a predetermined threshold value.

Watanabe disclosed detecting abnormality (column 9 line 62,63) condition in a battery by sensing battery voltage 12 and comparing 24 with estimated voltage (Vest) of the battery (Fig. 3,7).

At the time the invention was made it would have been obvious for one of ordinary skill in the art to modify Okoshi by calculating a difference in voltage between an estimated battery voltage and a measured battery voltage disclosed as disclosed by Watanabe as an alternative method of detecting abnormality.

Re claim 17, Okoshi disclosed which one of the first detector or the second detector is abnormal (broken wire, short circuit) based on an absolute value of the difference between measured and reference (threshold) voltage (column 24 lines 8-25,40,41, column 25 lines 8-11, 35-44). Okoshi further disclosed that it would be impossible to perform various drive controls if one of the detection sensors 72,76 has a detection abnormality due to broken wire or short circuit (column 23 lines 46-55).

Watanabe disclosed detecting abnormality (column 9 line 62,63) condition in a battery by sensing battery voltage 12 and comparing 24 with estimated voltage (Vest) of the battery (Fig. 3,7).

Okoshi as modified by Watanabe did not expressly disclose converter stops the operation for increasing the voltage or the operation for decreasing the voltage when an abnormality of the first detector is tentatively detected in a case where the converter is performing the operation for increasing the voltage or the operation for decreasing the voltage, wherein the monitoring portion includes a determining portion that determines which one of the first detector or the second detector is abnormal based on an absolute value of the difference between the voltage value of the battery detected by the first detector and the estimated voltage value, and an absolute value of the difference between the voltage value detected by the second detector and the estimated voltage value when the converter stops the operation for increasing the voltage or the operation for decreasing the voltage.

At the time the invention was made it would have been obvious for one of ordinary skill in the art to modify Okoshi by comparing the measured battery with an estimated battery voltage disclosed by Watanabe as an alternative means for providing a reference voltage for comparison for abnormality detection and to stop converter operation for increasing the voltage or decreasing the voltage when an abnormal condition is detected since Okoshi disclosed that it would be impossible to perform various drive controls if one of the detection sensors has a detection abnormality due to broken wire or short circuit.

Re claim 18, Okoshi disclosed electric current value detecting means (detect battery current) for detecting an electric current (column 8 line 13-17) value of the battery, and means for estimating battery voltage (SYSTEM VOLTAGE DETERMINATION PROCESSING MEANS)(processing means 91 sets the battery voltage)(column 15 line 25).

Okoshi as modified by Watanabe did not expressly disclose estimated voltage value is based on an electric power command value indicating a value of electric power supplied to the load and the electric current value of the battery. However, determining voltage value when the value of power and current supplied are known requires only an ordinary skill in the art since it is known that voltage (V) can be estimated from the relation V=P/I (where P=Power and I =current).

At the time the invention was made it would have been obvious for one of ordinary skill in the art to modify Okoshi and Watanabe by including a means for estimating battery voltage from the relation V=P/I for determining a reference value for comparison with measured value to determine abnormal condition.

Re claim 19, Okoshi did not expressly disclose learning means for learning and calculating the estimated voltage value.

Watanabe disclosed calculating means (neural network) (Fig. 5) for learning and calculating the estimated voltage value (dynamic voltage change estimating means 20)(column 8 line 36-42).

At the time the invention was made it would have been obvious for one of ordinary skill in the art to modify Okoshi by adding learning means disclosed by Watanabe for responding to the non-linear characteristic of the battery for calculating the estimated voltage value.

Re claim 20, Okoshi disclosed abnormal monitoring apparatus includes an abnormality monitoring portion that monitors an abnormality of at least one of the first detector and the second detector by continuing to monitor an abnormal state of at least one of the first detector and the second detector for a predetermined time or more (column 25, lines 35-47)(Fig. 24).

Conclusion

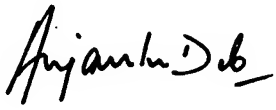
3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nomura (US 2003/0132756 A1) disclosed sensor fault diagnosis method in an apparatus for output control.

Ohsawa (US 6,255,826 B1) disclosed sensor abnormality detection in battery voltage measuring device.

Reynolds et al. (US 2006/0033476 A1) disclosed method of detection of defective battery voltage sensor by comparing measured voltage to known battery voltage profile.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is 571-272-2228. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew H. Hirshfeld can be reached at (571) 272-2168.



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